

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1.(Original): A medical balloon catheter comprising a balloon having a groove and/or a projection helically provided on the balloon relative to the longitudinal axis of the balloon.

2. (Original): The medical balloon catheter according to claim 1, wherein the groove and/or the projection are helically provided on at least one balloon taper relative to the longitudinal axis of the balloon.

3. (Original): The medical balloon catheter according to claim 2, wherein the groove and/or the projection helically provided on a balloon taper relative to the longitudinal axis of the balloon are continuously provided at an angle ranging from 15° to 180° when viewed from the distal end, the angle being defined by a center-line connecting the center and a starting point and another-line connecting the center and an ending point.

4. (Original): The medical balloon catheter according to claim 2 or 3, wherein the groove and/or the projection are helically provided on a distal balloon taper relative to the longitudinal axis of the balloon, said the groove and/or the projection being extending from the distal end to the proximal side.

5.(Currently Amended): The medical balloon catheter according to ~~any one of claims~~ claim 1 to 4, wherein a plurality of grooves and/or projections are helically provided on a balloon taper relative to the longitudinal axis of the balloon.

6. (Currently Amended): The medical balloon catheter according to ~~any one of claims~~ claim 1 to claim 5, wherein the number of the grooves and/or projections helically provided on a balloon taper relative to the longitudinal axis of the balloon is 2 to 5.

7. (Currently Amended): The medical balloon catheter according to ~~any one of claims~~ claim 1 to 6, wherein the width of the groove and/or the projection helically provided on a balloon taper relative to the longitudinal axis of the balloon varies in the direction of the longitudinal axis of the balloon.

8. (Currently Amended): The medical balloon catheter according to ~~any one of claims~~ claim 1 to 7, wherein the width of the groove and/or the projection helically provided on a balloon taper relative to the longitudinal axis of the balloon is 1  $\mu\text{m}$  or more.

9. (Currently Amended): The medical balloon catheter according to ~~any one of claims~~ claim 1 to 8, wherein the width of the groove and/or the projection helically provided on a balloon taper relative to the longitudinal axis of the balloon is 10  $\mu\text{m}$  to 1,000  $\mu\text{m}$ .

10. (Currently Amended): The medical balloon catheter according to ~~any one of claims~~ claim 1 to 9, wherein the depth of the groove and/or the height of the projection helically provided on a balloon taper relative to the longitudinal axis of the balloon is 0.01 m or more.

11. (Currently Amended): The medical balloon catheter according to ~~any one of claims~~ claim 1 to 10, wherein the depth of the groove and/or the height of the projection helically provided on a balloon taper relative to the longitudinal axis of the balloon is 0.1 mm or more to 3.0 mm or less.

12. (Currently Amended): The medical balloon catheter according to ~~any one of claims~~ claim 1 to 11, wherein the length of the groove and/or the projection helically provided on a balloon taper relative to the longitudinal axis of the balloon is 0.1 mm or more to 4.0 mm or less.

13. (Original): A method for producing a balloon catheter including a balloon having a groove and/or a projection helically provided on a balloon taper relative to the longitudinal axis of the balloon, the method comprising forming the balloon with a mold.

14. (Original): A method for producing a balloon catheter including a balloon having a groove and/or a projection helically provided on a balloon taper relative to the longitudinal axis of the balloon, the method comprising applying thermal energy to a preliminary formed balloon to form a groove and/or a projection helically provided on the balloon relative to the longitudinal axis of the balloon.

15. (Original): A method for producing a balloon catheter including a balloon having a groove and/or a projection helically provided on a balloon taper relative to the longitudinal axis of the balloon, the method comprising irradiating a preliminarily formed balloon with a laser to form a groove and/or a projection on a balloon taper helically provided relative to the longitudinal axis of the balloon.

16. (Original): The method for producing the balloon catheter according to any one of claims 13 to 15, wherein the groove and/or the projection to be helically provided on a balloon taper relative to the longitudinal axis of the balloon are formed on at least one balloon taper.

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17. (Original): The method for producing the balloon catheter according to any one of claims 13 to 15, wherein the groove and/or the projection to be helically provided on a balloon taper relative to the longitudinal axis of the balloon are formed on a distal balloon taper, the groove and/or the projection extending from the distal end to the proximal side.